

THE IMPORTANCE OF PERFORMING ADEQUATE HEARING TESTS IN CHILDREN WITH CEREBRAL PALSY

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Speech is an expression of man's intelligence, and it is his ability to communicate verbally that gives him his position of superiority above all other creatures.

The ability to learn to speak depends on adequate hearing, and it is too often forgotten that persons with speech defects often owe this disability to defective hearing. While adequate speech is often taken to be a sign of intelligence, a lack of speech is often interpreted as meaning a lack of intelligence, and in lay parlance the word 'dumb' is still erroneously equated with mental retardation. In recent years many people have been discovered who, having first been diagnosed as mentally retarded, were in fact found to be deaf. After specialized teaching methods were applied, normal intelligence was displayed. Such people may take a useful part in society instead of being relegated to the scrapheap of the 'dumb'.

In the non-cerebral palsy population, the incidence of hearing defects is said to be 0.1 - 0.2%¹ and efforts are now being made to examine all school-going children as a routine to detect hearing defects.

To do a complete hearing test on an average child may take as long as an hour, and when a child is handicapped, the time given for adequate testing has to be considerably longer. For this reason tests have to be devised to screen all children so that those who obviously have normal hearing need not be tested and adequate tests are given only to doubtful patients.

TESTING FOR DEAFNESS

Sound may be measured in terms of tone (as cycles per second) and volume (as decibels). Normal speech covers a range from 500 to 6,000 cycles per second and is normally heard by people who have a loss of not more than 10 decibels for each particular tone.

A test which detects hearing loss for a range of selected tones at 15 decibels will thus screen those who need more adequate hearing testing.

Forest Town School

Such a test was done on a random sample of 68 cerebral palsied children at Forest Town School. Of these, 20 had normal hearing, and 48 required complete testing (Table I).

Children attending the school with conditions other than true cerebral palsy (e.g. brain-injured children, and children not yet adequately diagnosed) were not included in the above figures.

For a long time it has been known that many children with athetosis have partial hearing loss involving the high

TABLE I. SCREENING TEST FOR DEAFNESS AT FOREST TOWN SCHOOL

	Total	Normal hearing	Required further testing
Athetoid	18	2	16
Spastics	42	15	27
Ataxics	5	3	2
Mixed	3	0	3
Total	68	20	48

tones,⁷ but little attention has been paid to hearing defects in children with other forms of cerebral palsy. It is obvious from this survey that in all types of cerebral palsy adequate hearing tests are necessary.

Other Surveys

How then have these patients been missed? Early surveys of cerebral palsy mentioned an incidence of deaf-

TABLE II. EARLY SURVEYS FOR DEAFNESS IN CEREBRAL PALSY

Authors	Place and date	No. tested	No. with hearing loss	Percentage with hearing loss
Asher and Schonell ²	Birmingham (1950)	400	13	3
Woods ³	Bristol area (1957)	301	22	7
Barclay ⁴	.. .. .	160	6	4
MacGregor <i>et al.</i> ⁵	London (1957)	722	36	5
Henderson ⁶	Dundee area (1961)	126	7	6
Total .. .. .	.. .. .	1,709	84	5

ness of about 5% (Table II). These workers all took groups of children in whom hearing loss was assessed by parents' and teachers' reports. Where careful testing has been done, a very different picture emerges. (Table III).

Mowat,¹² writing in Henderson's recent survey of cerebral palsy in the Dundee district, stated that of the 14 deaf patients found among 70 cerebral palsy children tested, 10 were non-athetoids. He makes the most important observation that: 'Only 3 of the 16 deaf patients were previously known to be deaf, though the parents of 3 others had suspected deafness. Thus, in no fewer than 10 (63%) deafness had not been suspected at all'.

In the deaf spastics discovered by Fisch, only 4 had been suspected before testing. These findings led Ewing¹⁴

TABLE III. MORE ADEQUATE SURVEYS FOR DEAFNESS IN CEREBRAL PALSY

Authors	Date	No. tested	Diagnosed condition or type of school	No. deaf	% deaf
Asher ⁸	.. 1952	42	Athetosis	26	62
Crabtree and Gerrard ⁷	.. 1950	20	Following kernicterus	16	80
Fisch ⁹ ..	.. 1955	89	Special school ..	30	34
Porter ¹⁰	.. 1957	388	Special schools ..	271	70
Fisch ¹¹ ..	.. 1957	427	Cerebral palsy ..	107	25
Mowat ¹²	.. 1961	70	Cerebral palsy in Dundee area	14	25
Fisch and Back ¹³	.. 1961	76		19*	20
Total	..	1,112		483	45

*These 19 children had significant hearing loss.

to stress the need for special arrangements to test the hearing in all cerebral palsy children.

The provision of special testing facilities appears at first to be an expensive undertaking, particularly if testing has to be done under ideal conditions in a sound-proof room. However, Ewing¹⁴ stated that 'sound-proof' rooms are not needed for the administration of screening tests. The cost of screening, therefore, would be that of the pure-tone audiometer and the time taken.

It is interesting to know that various authors (Ewing and Mowat) pointed out that the incidence of deafness is unrelated to the child's intelligence, though Mowat found that the greater the severity of the neurological lesion in cerebral palsy, the higher the incidence of deafness.

EDUCATION

Once it has been established that a hearing loss exists, special education methods may be provided to compensate for the defect.

Ewing¹⁴ stated that if comprehensive provision for children with cerebral palsy and hearing deficiencies is to be planned, the following will be found:

'(a) The need for special physical training and often of special physical conditions with regard to building and furniture;

'(b) The need to promote, by training, the maximum use of residual hearing and reliance upon it;

'(c) The need for expert assessment and periodic re-assessment during the progress of remedial training of the handicapped child's abilities, temperament, and general and mental growth; and

'(d) The need for continuous study of a child's social development and the motivation towards learning which it offers him.'

SUMMARY

Early surveys of hearing defects in children afflicted with cerebral palsy underestimated the true incidence of deafness. This can only be assessed after complete testing by adequate methods.

A plea is made that all children suffering from cerebral palsy should have an adequate hearing test, and that facilities be provided for dealing with those who are hard of hearing.

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